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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/009,288	04/04/2002	Frank Kowalewski	10191/2062	5733
26646	7590	09/16/2005	EXAMINER	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			PATHAK, SUDHANSHU C	
			ART UNIT	PAPER NUMBER
			2634	
DATE MAILED: 09/16/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/009,288	Applicant(s) KOWALEWSKI, FRANK	
	Examiner Sudhanshu C. Pathak	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on April 4<sup>th</sup>, 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-17 and 21-24 is/are rejected.
- 7) ☒ Claim(s) 18-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on April 4<sup>th</sup>, 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>November 6<sup>th</sup>, 2001</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-to-12 have been canceled (as per preliminary amendment April 4<sup>th</sup>, 2002).
2. Claims 13-to-24 are pending in the application.

### *Specification*

3. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

**The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details. It is recommended the applicant provide further details in the abstract, though not exceeding 150 words.**

4. The disclosure is objected to because of the following:
  - In the (substitute) specification on Page 3, line 28 discloses the variable "W" being the number of chips however; the specification does not disclose what are the chips.
  - In the (substitute) specification on Page 4, line 1 discloses " $N = L - W + 1$ ", however, the specification does not disclose what the variable "L" represents.

- In the (substitute) specification on Page 4 discloses an equation for a first estimation of the transmission channel however, the specification does not disclose what the variable " $\gamma$ " and the matrix " $G$ " represent.
- In the (substitute) specification on Page 5 discloses an equation for computing the intensity of additive interferences however, the specification does not disclose what the variable " $f$ " represents.
- It is recommended that each equation be designated numerically.

Appropriate correction is required.

### ***Claim Objections***

5. Claims 15, 18, 21-22 are objected to because of the following informalities:

- Claim 15 discloses an equation of a matched filter however; the claim does not disclose what the variables " $\gamma$ ", " $N$ ", " $L$ " the matrix " $G$ " represent.
- Claim 18 discloses the estimation of the additive interference however, the claim does not disclose what the variables " $f$ ", " $N$ " and " $E$ " represent.
- Claim 21 on line 2 discloses "a POCS algorithm", however the claim does not disclose what the acronym POCS represents.
- Claim 22 on line 2 discloses "a MMSE algorithm", however the claim does not disclose what the acronym MMSE represents.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 13-14, 21-22 & 24 are rejected under 35 U.S.C. 102(b) as being anticipated by the Applicant Admitted Prior Art (AAPA).

Regarding to Claims 13 & 24, a method for estimating a memory-enabled transmission channel (Substitute Specification, Page 1, Background Information, lines 8-9), comprising the steps of: determining a first estimation of a pulse response of the memory-enabled transmission (Substitute Specification, Page 1, Background Information, lines 9-12) {Interpretation}: The AAPA discloses channel estimator for determining impulse response of transmission channel}; performing an estimation of an additive interference of the memory-enabled transmission (Substitute Specification, Page 1, Background Information, lines 16-26) {Interpretation}: The AAPA discloses the estimation of the additive noise as inherent and further discloses an algorithm for correctly estimating the coefficients}; and performing a correction of the first estimation while taking into consideration the estimation of the additive interference (Substitute Specification, Page 1, Background Information, lines 9-10, 16-25 & Page 2, lines 1-6) {Interpretation}: The AAPA discloses a method for correctly estimating the additive noise and correcting the coefficients of the channel impulse response}.

Regarding to Claim 14, a method according to Claim 13 wherein: the step of determining the first estimation is performed by a matched filter (Substitute Specification, Page 1, Background Information, lines 13-14).

Regarding to Claim 21, a method according to Claim 13 wherein: the correction of the first estimation is given by a POCS algorithm (Substitute Specification, Page 1, Background Information, lines 19-26).

Regarding to Claim 22, a method according to Claim 13 wherein: the correction of the first estimation is given by a MMSE algorithm (Substitute Specification, Page 1, Background Information, lines 24-25).

8. Claims 13, 16 & 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Andersson et al. (WO 98/44655).

Regarding to Claims 13 & 24, a method for estimating a memory-enabled transmission channel (Abstract, lines 1-6 & Specification, Page 1, lines 3-15) {Interpretation: a digital wireless communications radio channel is a memory-enabled transmission channel}, comprising the steps of: determining a first estimation of a pulse response of the memory-enabled transmission (Specification, Page 14, lines 10-14 & Fig. 3, element 310); performing an estimation of an additive interference of the memory-enabled transmission (Specification, Page 1, lines 15-21 & Specification, Page 4, lines 25-28 & Specification, Page 5, lines 1-2 & Specification, Page 14, lines 15-19 & Specification, Page 15, lines 1-2 & Fig. 3, element 320) {Interpretation: The Intersymbol Interference (ISI) as disclosed in the reference is considered additive interference and the ISI interference estimate is an estimate of an additive interference estimate}; and performing a correction of the first estimation while taking into consideration the estimation of the additive interference (Abstract, lines 3-4 & Specification, Page 5, lines 3-6 & Specification, Page 15, lines

3-6 & Fig. 3, elements 320-340) (Interpretation: The reference discloses a compensation means for estimating the channel response taking into consideration the additive interference (ISI)).

Regarding to Claim 16, a method according to Claim 13 wherein: the first estimation is given by a least squares estimation (Specification, Page 3, lines 18-22 & Specification, Page 10, lines 3-6 & Specification, Page 4, lines 10-20).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 14 & 21-22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al. (WO 98/44655) in view of the Applicant Admitted Prior Art (AAPA).

Regarding to Claim 14, a method according to Claim 13, wherein the step of determining the first estimation is performed a matched filter. Andersson discloses all the limitations regarding the method for estimating a transmission channel as described above. However, the Andersson does not disclose the first estimation is given by a matched filter.

The AAPA discloses the most widely used channel estimators are based on a matched filter (Specification, Page 1, lines 12-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that AAPA

teaches implementing a matched filter to estimate the channel impulse response and this can be implemented in the method as described in Andersson so as to provide a simple estimator.

Regarding to Claim 21, a method according to Claim 13 wherein: the correction of the first estimation is given by a POCS algorithm. Andersson discloses all the limitations regarding the method for estimating a transmission channel as described above. However, the Andersson does not disclose the correction of the first estimation is given by a POCS algorithm.

The AAPA discloses the correction of the first estimation is given by a POCS algorithm (Substitute Specification, Page 1, Background Information, lines 19-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the AAPA discloses a POCS algorithm for the correction of the estimation coefficients and this can be implemented in the method as described in Andersson so as to provide a more accurate estimate of the channel estimate.

Regarding to Claim 22, a method according to Claim 13 wherein: the correction of the first estimation is given by a MMSE algorithm. Andersson discloses all the limitations regarding the method for estimating a transmission channel as described above. However, the Andersson does not disclose the correction of the first estimation is given by a MMSE algorithm.

The AAPA discloses the correction of the first estimation is given by a MMSE algorithm (Substitute Specification, Page 1, Background Information, lines 24-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of



the invention that the AAPA discloses a MMSE algorithm for the correction of the estimation coefficients and this can be implemented in the method as described in Andersson so as to provide a more accurate estimate of the channel estimate.

11. Claim 15 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al. (WO 98/44655) in view of the Applicant Admitted Prior Art (AAPA) in further view of Steiner et al. (Low Cost Channel Estimate in the Uplink Receiver of CDMA Mobile Radio Systems; Berlin, Germany; Vol. 47, No. 11/12; Nov. 1, 1993; Page 292-298).

Regarding to Claim 15, a method according to Claim 14, wherein the matched filter is given by (the equations as described in the Claim). Andersson in view of AAPA discloses all the limitations regarding the method for estimating a transmission channel using a matched filter as described above. However, Andersson in view of AAPA does not disclose the matched filter is given by (the equations as described in the Claim).

Steiner discloses the equations as described in the claim (Page 293, left-column, Eq.'s 3a-b & Page 293, right-column, Eq.'s 13-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Steiner teaches the equations as described in the claim so as to mathematically describe the channel estimate implemented using a matched filter.

Regarding to Claim 23, a method according to Claim 22, wherein the MMSE algorithm is given by (the equation as described in the Claim). Andersson in view of AAPA discloses all the limitations regarding the method for estimating a

transmission channel using a MMSE algorithm as described above. However, Andersson in view of AAPA does not disclose the MMSE is given by (the equation as described in the Claim).

Steiner discloses the equation as described in the claim (Page 293, right-column, Eq.'s 10-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Steiner teaches the equations as described in the claim so as to mathematically describe the channel estimate implemented using a MMSE algorithm.

12. Claims 15 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Steiner et al. (Low Cost Channel Estimate in the Uplink Receiver of CDMA Mobile Radio Systems; Berlin, Germany; Vol. 47, No. 11/12; Nov. 1, 1993; Page 292-298).

Regarding to Claim 15, a method according to Claim 14, wherein the matched filter is given by (the equations as described in the Claim). The AAPA discloses all the limitations regarding the method for estimating a transmission channel using a matched filter as described above. However, the AAPA does not disclose the matched filter is given by (the equations as described in the Claim).

Steiner discloses the equations as described in the claim (Page 293, left-column, Eq.'s 3a-b & Page 293, right-column, Eq.'s 13-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Steiner teaches the equations as described in the claim so as to mathematically describe the channel estimate implemented using a matched filter.

Regarding to Claim 23, a method according to Claim 22, wherein the MMSE algorithm is given by (the equation as described in the Claim). The AAPA discloses all the limitations regarding the method for estimating a transmission channel using a MMSE algorithm as described above. However, the AAPA does not disclose the MMSE is given by (the equation as described in the Claim).

Steiner discloses the equation as described in the claim (Page 293, right-column, Eq.'s 10-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Steiner teaches the equations as described in the claim so as to mathematically describe the channel estimate implemented using a MMSE algorithm.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the

Applicant Admitted Prior Art (AAPA) in view of Andersson et al. (WO 98/44655).

Regarding to Claim 16, a method according to Claim 13, wherein the first estimation is given by a least squares estimation. The AAPA discloses all the limitations regarding the method for estimating a transmission channel as described above. However, the AAPA does not disclose the first estimation is given by least squares estimation.

Andersson discloses determining the channel estimate using the least squares algorithm (Specification, Page 3, lines 18-22 & Specification, Page 10, lines 3-6 & Specification, Page 4, lines 10-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Andersson teaches implementing a channel estimate using the least squares estimate and this can be

implemented in the method as described in the AAPA so as to provide a computationally cheaper algorithm.

14. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al. (WO 98/44655) in view of Steiner et al. (Low Cost Channel Estimate in the Uplink Receiver of CDMA Mobile Radio Systems; Berlin, Germany; Vol. 47, No. 11/12; Nov. 1, 1993; Page 292-298).

Regarding to Claim 17, a method according to Claim 16, wherein the least squares estimation is given by (the equation as described in the Claim). Andersson discloses all the limitations regarding the method for estimating a transmission channel using a least squares estimate as described above. However, Andersson in does not disclose the least square estimate is given by (the equation as described in the Claim).

Steiner discloses the equation as described in the claim (Page 293, right-column, Eq. 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Steiner teaches the equation as described in the claim so as to mathematically describe the channel estimate implemented using a least squares estimate.

15. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Andersson et al. (WO 98/44655) in further view of Steiner et al. (Low Cost Channel Estimate in the Uplink Receiver of CDMA Mobile Radio Systems; Berlin, Germany; Vol. 47, No. 11/12; Nov. 1, 1993; Page 292-298).

Regarding to Claim 17, a method according to Claim 16, wherein the least squares estimation is given by (the equation as described in the Claim). The AAPA in view of Andersson discloses all the limitations regarding the method for estimating a transmission channel using a least squares estimate as described above.

However, the AAPA in view of Andersson does not disclose the least square estimate is given by (the equation as described in the Claim).

Steiner discloses the equation as described in the claim (Page 293, right-column, Eq. 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Steiner teaches the equation as described in the claim so as to mathematically describe the channel estimate implemented using a least squares estimate.

### ***Allowable Subject Matter***

16. Claims 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
- The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak



**SHUWANG LIU**  
**PRIMARY EXAMINER**

9/15/05